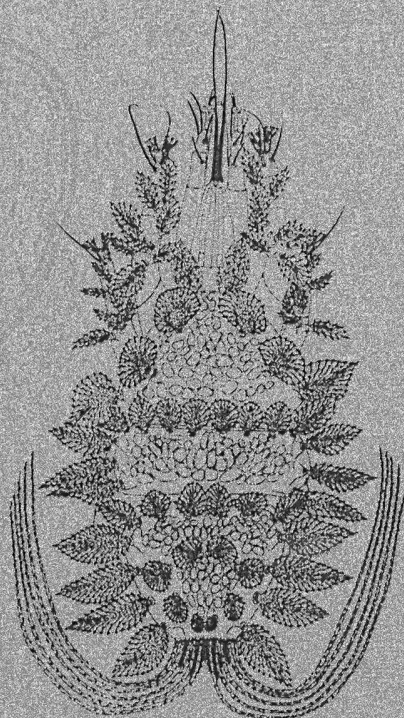


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Cover: Ornate false spider mites (Tuckerellidae) are early derivative members of the economically important Tetranychoidae - spider mites, clover mites, flat mites, etc.. This species, *Tuckerella* sp. nr. *flabellifer* Miller, feeds on the stems of the introduced weed lantana and on a variety of native trees and shrubs. Illustration by Juanita Choo, Department of Zoology and Entomology, University of Queensland.

NEW SPECIES AND RECORDS OF FRUIT FLIES (DIPTERA: TEPHRITIDAE: DACINAE) FROM NORTH QUEENSLAND

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Abstract

Four new species of Dacinae from Australia are described and illustrated: *Bactrocera* (*Bactrocera*) *parabarringtoniae* sp. nov., *B. (Bactrocera)* *yorkensis* sp. nov., *B. (Bulladacus)* *neotigrina* sp. nov. and *B. (Hemizeugodacus)* *ektoalangi* sp. nov. Notes on distribution and lures are presented for nine further species in northern Queensland.

Introduction

The tropical fruit fly fauna (subfamily Dacinae) of Australia is endemic to the northern and northeastern parts of the country and is reasonably well known (Drew 1989). Since the last major survey of northern Queensland (Drew *et al.* 1981), extensive trapping and host fruit collections have been made during the eradication programme for *Bactrocera papayae* Drew & Hancock (Asian Papaya fruit fly) in North Queensland, plus continuing North Australian Quarantine Survey work in Torres Strait. This has resulted in new host and geographic records and the collection of several undescribed species. These species are described in this paper and several new distribution records presented. Host records will be presented elsewhere.

Specimen depositories are abbreviated as follows: ANIC, Australian National Insect Collection, Canberra; BMNH, The Natural History Museum, London; QDPI, Queensland Department of Primary Industries, Brisbane; QM, Queensland Museum, Brisbane.

Systematics

Bactrocera (Bactrocera) Macquart

Bactrocera (Bactrocera) amplexiseta (May)

Comments. This species is widespread in both high and low altitude rainforests from Auravale and Mt Poverty (south of Cooktown) to the Ingham area and inland to the Atherton Tableland. The host is unknown.

Bactrocera (Bactrocera) barringtoniae (Tryon)

Comments. As a result of this study it is now possible to amend attractant and distribution records in Drew (1989). *B. barringtoniae* has been recorded only from the Cairns district and does not respond to any male lure. The record of attraction to cue lure (Drew 1989) is incorrect. This was proven during December 1995 at Brinsmead, Cairns, when the authors placed cue lure and methyl eugenol traps in and around a large *Barringtonia calypttrata* tree that had ripe fruit heavily infested with *B. barringtoniae*. No specimens were attracted to either male lure, while 256 males and 258 females were reared from a single fruit sample from the same tree on 15.xii.1995.

Previous records from Torres Strait islands (Drew 1989) refer to *B. parabarringtoniae* sp. nov. which is strongly attracted to methyl eugenol and breeds in *Barringtonia racemosa*.

***Bactrocera (Bactrocera) diospyri* Drew**

Comments. Four males were collected in a methyl eugenol trap on Green Island, east of Cairns, on 28.viii.1998 and 4.ix.1998. This is a significant extension of the previously known range of coastal Northern Territory and Torres Strait islands (Drew 1989). Elsewhere this species has not been recorded at lures and the response may be due to placement of the trap in a host tree, *Diospyros maritima* (Ebenaceae), from which 5 males and 8 females were bred from fruit collected on 29.ix.1998.

***Bactrocera (Bactrocera) frauenfeldi* (Schiner)**

Comments. Previously known from Cape York Peninsula (Drew 1989), as far south as Weipa and Iron Range, this species was recorded from the Cairns area in 1994 by Osborne *et al.* (1997). It is now known to be widespread between Cooktown and Townsville and inland to the Atherton Tableland. The first Townsville records are 13.x.1997 and 24.xi.1997, collected in cue lure traps (DPI State quarantine survey).

***Bactrocera (Bactrocera) opiliae* (Drew & Hardy)**

Comments. Previously known from northern Western Australia and the Northern Territory (Drew 1989), this species was collected in methyl eugenol traps at Adel's Grove, near Lawn Hill, northwestern Queensland, on 21.i.1998 (DPI State quarantine survey).

***Bactrocera (Bactrocera) papayae* Drew & Hancock**

Comments. This major pest species has occurred sporadically on Torres Strait islands since 1993, following its introduction to Papua New Guinea via Irian Jaya. An established population was detected in the Cairns area in October 1995, with subsequent detections made from Cooktown to Cardwell before its eradication by mid 1998, the last specimens being recorded from mainland Australia in July 1997.

***Bactrocera (Bactrocera) parabarringtoniae* Drew & Hancock, sp. nov.**

(Fig. 1)

Types. QUEENSLAND: *Holotype* ♂, Stephen Is., Torres Strait, 17.v.1995, attracted to methyl eugenol (in QM, Reg. No. T.57677); *paratypes*: 5 ♂♂, same data as holotype; 21 ♂♂, Stephen Is., Torres Strait, 25.iv.1995, R. Stephen, attracted to methyl eugenol; 9 ♂♂, Stephen Is., Torres Strait, Site 3, 31.v.1995, attracted to methyl eugenol; 8 ♂♂, 10 ♀♀, track to Tom's house, Stephen Island., 5.iv.1995, R. Stephen, bred from *Barringtonia racemosa* (SV141); 5 ♂♂, 8 ♀♀, track to Tom's house, Stephen Is., 8.iv.1995, R. Stephen, bred from *Barringtonia racemosa* (SV143). 6 ♂♂, 3 ♀♀ in QM, Reg. Nos T.57678 – T.57686; 6 ♂♂, 3 ♀♀ in ANIC; 30 ♂♂, 9 ♀♀ in QDPI; 6 ♂♂, 3 ♀♀ in BMNH.

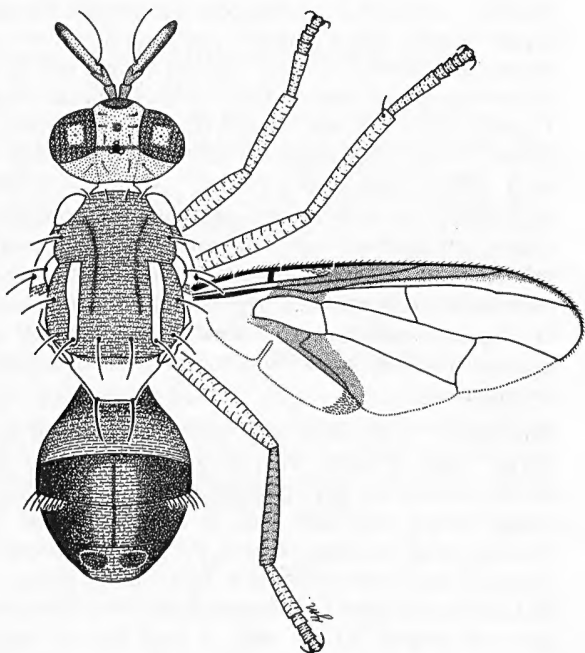


Fig. 1. *Bactrocera (Bactrocera) parabarringtoniae* Drew & Hancock, sp. nov.

Description of male

Head. Vertical length 1.7 mm. Frons length 1.56 times breadth; orange-brown except with narrow fulvous anterolateral margins, fuscous on anteromedial hump and pale fuscous around bases of orbital setae, latter covered with a small number of short dark hairs; orbital setae black: 1 *s.or.*, 2 *i.or.*; lunule pale fuscous. Ocellar triangle black. Vertex red-brown to pale fuscous. Face fulvous with a pair of medium sized oval black spots present; length 0.47 mm. Genae fulvous with brown subocular spots present; red-brown seta present. Occiput orange-brown, fulvous along eye margins; occipital row with 4-8 strong red-brown to black setae. Antennae with segments 1 and 2 red-brown to pale fuscous; segment 3 orange-brown with fuscous on apex and outer surface; short pale dorsal seta on segment 2; arista black (orange-brown basally); length of segments: 0.22 mm; 0.36 mm; 0.88 mm.

Thorax. Scutum dark red-brown with a pattern of narrow lateral longitudinal fuscous bands. Pleural areas pale fuscous to dark fuscous except red-brown below postpronotal lobes. Yellow markings as follows: postpronotal lobes; notopleura; mesopleural stripe of medium width reaching almost to anterior *npl.* bristle dorsally, continuing to katapisternum as a large transverse spot,

anterior margin slightly convex; anatergite (posterior apex fuscous to dark fuscous); anterior 2/3 katatergite (remainder fuscous to dark fuscous); two broad parallel-sided lateral postsutural vittae ending behind *ia*. seta. Postnotum fuscous to dark fuscous except red-brown centrally. Scutellum yellow except for narrow dark red-brown basal band. Setae: *sc*. 2, *prsc*. 2, *ia*. 1, *p.sa*. 1, *a.sa*. 1, *mpl*. 1, *npl*. 2, *scp*. 4; all setae well developed and red-brown. Legs – all segments fulvous except hind tibiae fuscous; mid tibiae each with an apical black spur. Wings – length 6.2 mm; cells *bc* and *c* colourless or with a very pale tint; microtrichia in outer corner of cell *c* only; remainder of wings colourless or with a very pale tint except fuscous cell *sc*, narrow fuscous costal band overlapping R_{2+3} and becoming very narrow between apices of R_{2+3} and R_{4+5} before ending just beyond extremity of R_{4+5} , a broad fuscous cubital streak ending at wing margin. Dense aggregation of microtrichia around A_1+CuA_2 ; supernumerary lobe of medium development.

Abdomen. Oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I and II generally red-brown to fuscous except for large posterolateral fulvous areas on tergum II; terga III-V orange-brown centrally with a narrow medial longitudinal diffuse pale fuscous band on terga III and IV and two broad lateral longitudinal dark fuscous bands over terga III-V and joining along anterior margin of tergum III (sometimes paler on posterolateral areas of tergum IV and around shining spots on tergum V). A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short; sternum V with a deep concavity on posterior margin.

Female. As for male except supernumerary lobe weak; abdominal tergum III without pecten. Ovipositor: basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V, 0.33:1. Aculeus needle shaped at apex.

Attractant. Methyl eugenol.

Distribution. Torres Strait islands (known from Badu, Darnley, Nepean, Saibai, Stephen, Thursday and Yorke Islands).

Host. *Barringtonia racemosa* (Lecythidaceae).

Comments. *B. parabarringtoniae* is similar to *B. aithogaster* Drew, *B. barringtoniae* (Tryon) and *B. peninsularis* (Drew & Hancock) in possessing a general red-brown scutum and pale abdominal terga III-V with lateral dark colour patterns. It differs from these species in having abdominal terga III-V with broad lateral longitudinal dark fuscous bands that are usually joined along anterior margin of tergum III and with terga III and IV possessing a narrow medial longitudinal diffuse pale fuscous band. In

addition, it differs from *B. barringtoniae* and *B. peninsularis* in having a pair of lateral longitudinal fuscous bands on the scutum.

***Bactrocera (Bactrocera) yorkensis* Drew & Hancock, sp. nov.**

(Fig. 2)

Types. QUEENSLAND: *Holotype* ♂, [base of] Rex Range (Site RFRR 001) [nr Mossman], 16.ix.1996, P. Gleeson *et al.*, attracted to methyl eugenol (in QM, Reg. No. T.57687); *paratypes*: 1 ♂, Somerset, Cape York, 28.vi.1995, PQ staff; 1 ♂, Mossman (Site MOSG 40), 7.xii.1995, QDPI; 1 ♂, Rex Range (Site RFRR 003), 20.v.1996, QDPI staff; 1 ♂, Rex Range (Site RFRR 005), 20.v.1996, QDPI staff; 1 ♂, Rex Range (Site RFRR 005), 27.v.1996, QDPI staff; 1 ♂, Rex Range (Site RFRR 001), 1.vii.1996, QDPI staff; 2 ♂♂, Kuranda (Site RFK 003), 31.v.1996, QDPI staff; 4 ♂♂, Palm Cove (Site NBG 6), Cairns, 28.xii.1996, QDPI staff; 1 ♂, Yarrabah, Cairns, ix.1996, C. Darling; all paratypes attracted to methyl eugenol. 1 ♂ in QM, Reg. No. T.57688; 3 ♂♂ in ANIC; 6 ♂♂ in QDPI; 3 ♂♂ in BMNH.

Other material examined. QUEENSLAND: 205 ♂♂, from the following localities: Hopevale, Cooktown, Amos Bay, Mt Poverty, Rossville, Shipton's Flat, Bloomfield River, Mossman, Port Douglas, Mowbray Valley, Oak Beach, Ellis Beach, Buchans Point, Palm Cove, Trinity Beach, Cairns, Yarrabah, Cardwell; all collected at methyl eugenol (all in QDPI, Cairns). Collected in all months of the year.

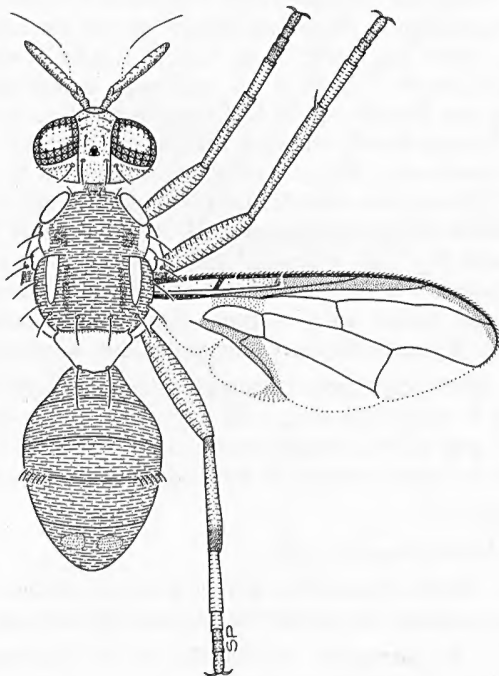


Fig. 2. *Bactrocera (Bactrocera) yorkensis* Drew & Hancock, sp. nov.

Description of male

Head. Vertical length 1.17 mm. Frons length 1.66 times breadth; orange-brown without dark markings; orbital setae red-brown: 1 *s.or.*, 2 *i.or.*; lunule orange-brown. Ocellar triangle black. Vertex orange-brown. Face fulvous, no dark spots or markings; length 0.42 mm. Genae fulvous, no subocular spot; pale seta present. Occiput orange-brown, fulvous along eye margins; occipital row with a large number of small pale setae. Antennae with segments 1 and 2 orange-brown, segment 3 orange-brown with pale fuscous on apex and outer surface; short pale dorsal seta on segment 2; arista black (orange-brown basally); length of segments: 0.12 mm; 0.22 mm; 0.56 mm.

Thorax. Scutum dark orange-brown with irregular pale fuscous to black patterns of varying size. Pleural areas dark orange-brown except for two small dark fuscous to black spots on anterior margin of katatergite and below wing. Yellow markings as follows: postpronotal lobes; notopleura; a broad yellow band connecting postpronotal lobe and notopleuron; broad mesopleural stripe reaching almost to postpronotal lobe dorsally, continuing to katapisternum as a large transverse spot, anterior margin strongly convex; anatergite (posterior apex black); anterior 2/3 katatergite (remainder black); two short lateral postsutural vittae tapering posteriorly to end before level of *ia*. setae. Postnotum orange-brown with narrow to broad dark fuscous to black lateral margins. Scutellum yellow except for narrow orange-brown basal band. Setae: *sc.* 2, *prsc.* 2, *ia.* 1, *p.sa.* 1, *a.sa.* 1, *mpl.* 1, *npl.* 2, *scp.* 4; all setae red-brown. Legs – all segments orange-brown except basal segments of tarsi fulvous, apical four segments of fore tarsi fuscous and hind tibiae with fuscous basally and dark fuscous apically; mid tibiae each with an apical red-brown spur. Wings – length 4.56 mm; cell bc pale fuscous, cell c with a pale tint only; microtrichia in outer corner of cell c only; remainder of wings colourless except dark fuscous cell sc, narrow dark fuscous costal band confluent with R_{2+3} and widening slightly at apex of wing before ending between extremities of R_{4+5} and M, a broad fuscous cubital streak narrowing sharply to end before wing margin. Dense aggregation of microtrichia around A_1+CuA_2 ; supernumerary lobe of medium development.

Abdomen. Oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All terga dark orange-brown without dark markings. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short; sternum V with a deep concavity on posterior margin.

Female. Unknown.

Attractant. Methyl eugenol.

Distribution. North Queensland; known from the northern tip of Cape York Peninsula at Somerset, the Cooktown to Cairns districts and near Cardwell.

Comments. *B. yorkensis* is similar to *B. diaphana* (Hering) and *B. ochromarginis* (Drew) in possessing general pale colouration of the thorax and abdomen, fulvous legs, wings with a narrow costal band and cubital

streak and a yellow band connecting the postpronotal lobes and notopleura. It differs from both species in having *prsc.* bristles, lateral postsutural vittae tapering to a point to end before the *ia.* setae, facial spots absent, costal cells with a pale tint and abdominal terga entirely orange-brown without dark markings. In addition it differs from *B. diaphana* in having the mesopleural stripe reaching almost to the postpronotal lobe, notopleura entirely yellow and costal cells without dense microtrichia. Most specimens were collected at low altitudes in or near eucalypt woodland.

Bactrocera (Bulladacus) Drew & Hancock

***Bactrocera (Bulladacus) neotigrina* Drew & Hancock, sp. nov.**

(Figs 3, 4)

Types. QUEENSLAND: *Holotype* ♂, Helenvale [nr Cooktown], 29.i.1997, D. Wood *et al.*, bred ex *Terminalia sericocarpa* (sample No. NQB 2819) (in QM, Reg. No. T.57689); *paratypes*: 1 ♂, 5 ♀♀, same data as holotype; 4 ♂♂, 8 ♀♀, Jensen's Crossing, NW of Cooktown, 16.xii.1996, D. Wood, bred ex *Terminalia sericocarpa* (sample No. NQC 352). 1 ♂, 2 ♀♀ in QM, Reg. No. T.57690 – T.57692; 1 ♂, 4 ♀♀ in ANIC; 2 ♂♂, 4 ♀♀ in QDPI; 1 ♂, 3 ♀♀ in BMNH.

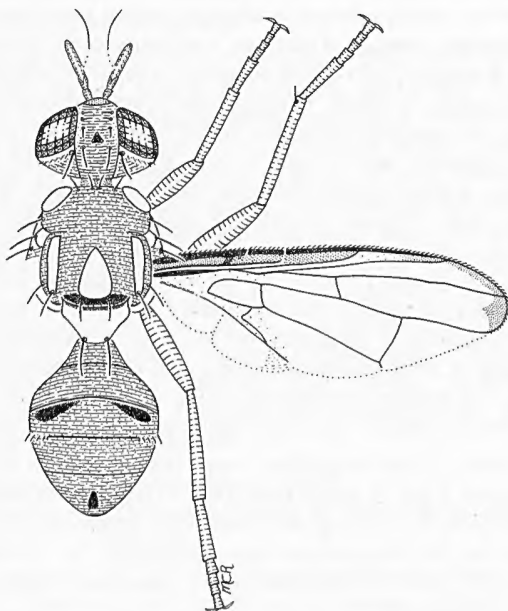


Fig. 3. *Bactrocera (Bulladacus) neotigrina* Drew & Hancock, sp. nov.

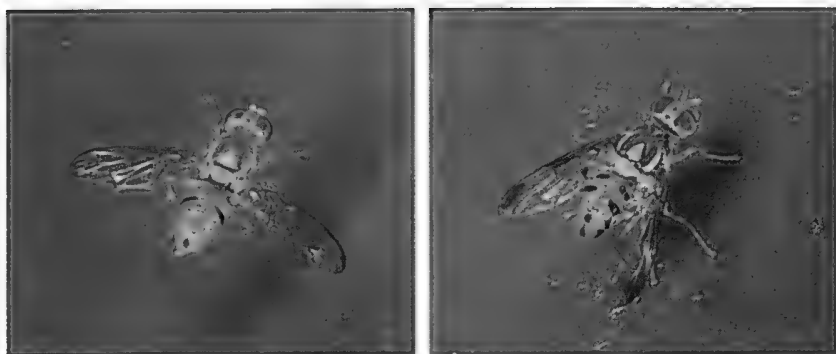
Description of male

Head. Vertical length 1.1 mm. Frons length 1.6 times breadth; orange-brown with fulvous lateral margins; anteromedial hump with a small number of short pale hairs; orbital setae red-brown: 1 *s.or.*, 2 *i.or.*; lunule red-brown. Ocellar triangle black. Vertex orange-brown. Face orange-brown centrally, fulvous laterally and without any dark markings or spots; length 0.4 mm. Genae fulvous, without dark subocular spot; red-brown seta present. Occiput orange-brown, fulvous along eye margins; occipital row with a large number of small pale setae. Antennae with all segments entirely fulvous; small pale dorsal seta on segment 2; arista black (pale red-brown basally); length of segments: 0.06 mm; 0.18 mm; 0.44 mm.

Thorax. Scutum orange-brown with a narrow black band along posterior margin and, in some specimens, a narrow longitudinal black band running from each end of this band to the mesonotal suture. Pleural areas orange-brown without dark markings. Yellow markings as follows: postpronotal lobes; notopleura; broad mesopleural stripe reaching to postpronotal lobe dorsally, continuing to katapisternum as a large transverse spot, anterior margin straight; anatergite (posterior apex black); anterior 3/4 katatergite (remainder black); two broad parallel sided lateral postsutural vittae ending behind *ia*. setae; a broad triangular medial postsutural vitta reaching almost to posterior margin of scutum, enclosing *prsc.* bristles and narrowing to a point anteriorly to end just posterior to level of mesonotal suture. Postnotum dark fuscous to black, tending red-brown dorsolaterally. Scutellum yellow except for narrow red-brown basal band. Setae: *sc.* 2, *prsc.* 2, *ia.* 1, *p.sa.* 1, *a.sa.* absent, *mpl.* 1, *npl.* 2, *scp.* 4; all setae red-brown. Legs – entirely fulvous without dark markings; mid tibiae each with an apical dark red-brown spur. Wings – length 3.8 mm; cells *bc* and *c* fuscous; microtrichia covering all of cell *c* and outer corner of cell *bc*; remainder of wings colourless except fuscous cell *sc*, narrow fuscous costal band confluent with R_{2+3} (paler in cell r_3) and expanding in apex of wing between R_{4+5} and *M* before ending at extremity of *M*, a very pale fuscous cubital streak. A swelling of wing membrane along anal cell extension that has the appearance of a colourless incomplete bulla. No distinct dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen. Oval; terga free; weak pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I-V orange-brown except fulvous posterolaterally on tergum II and black anterolaterally on tergum III and as a broad medial longitudinal spot on tergum V. Oval shining spots absent. Posterior lobe of surstylus short; sternum V with a deep concavity on posterior margin.

Female. As for male except supernumerary lobe weak; abdominal tergum III without pecten. Ovipositor: basal segment orange-brown; dorsoventrally compressed, tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V, 0.7 to 1.1 : 1. Aculeus needle shaped at apex.



Figs 4-5. *Bactrocera* (*Bulladacus*) spp. (4) *B. neotigrina*; (5) *B. tigrina*.
(Photographs by Paul Zborowski)

Attractant. Not attracted to known lures.

Distribution. Northeast Queensland; known from Cooktown to Gordonvale (Cairns district).

Host. *Terminalia sericocarpa* (Combretaceae).

Comments. *B. neotigrina* is similar to *B. tigrina* (May) (Fig. 5) in having facial spots absent, similar shaped lateral and medial postsutural vittae, yellow postpronotal lobes, broad mesopleural stripe reaching to postpronotal lobe and abdominal terga basically orange-brown. It differs from *B. tigrina* in possessing a red-brown scutum, abdominal terga III-V with markedly reduced dark patterns (anterolateral corners of tergum III and medial spot on tergum V black), a reduced or incomplete bulla in male wing, no sexual dimorphism in abdominal and wing colour patterns and costal band narrow and pale in cell r_1 . Both *B. tigrina* and *B. neotigrina* were bred from the same host, *Terminalia sericocarpa*, with *B. tigrina* also utilising *Terminalia muelleri*. This is unusual for species of subgenus *Bulladacus*, elsewhere known only from *Gnetum* spp. (Gnetaceae) and *Aglaia samoensis* (Meliaceae) (Drew and Hancock 1995 [possible misidentification]). Both *B. neotigrina* and *B. tigrina* occur in rainforests.

Bactrocera (*Hemizeugodacus*) Hardy

Bactrocera (*Hemizeugodacus*) *ektoalangiiae* Drew & Hancock, sp. nov.
(Fig. 6)

Types. QUEENSLAND: *Holotype* ♂, 3.5 km along Goldsborough Valley [nr Gordonvale], 13.i.1997, L. Cockett *et al.*, bred from *Alangium villosum* ssp *polysomoides* (sample No. MR 244) (in QM, Reg. No. T.57693); *paratypes*: 3 ♀♀, same data as holotype. 1 ♀ in ANIC; 2 ♀♀ in QDPI.

Description of male

Head. Vertical length 1.38 mm. Frons length 1.75 times breadth; orange-brown with narrow fulvous margins anterolaterally and a pale fuscous

anteromedial hump, the latter with a large number of short dark hairs; orbital setae black: 1 *s.or.*, 2 *i.or.*; lunule orange-brown to pale fuscous. Ocellar triangle black. Vertex orange-brown. Face fulvous with a pair of medium sized oval black spots; length 0.4 mm. Genae fulvous with a dark fuscous subocular spot; black seta present. Occiput orange-brown, fulvous along eye margins; occipital row with 4-5 strong black setae. Antennae with segments 1 and 2 red-brown, segment 3 broken off; a short black dorsal seta on segment 2; length of segments: 0.14 mm; 0.28 mm.

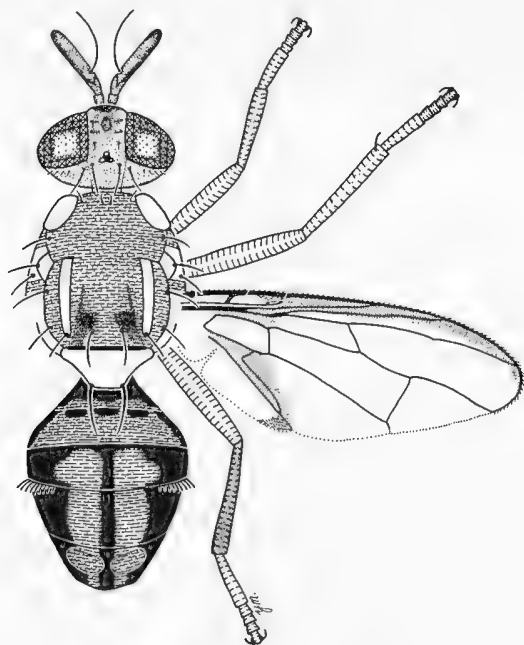


Fig. 6. *Bactrocera (Hemizeugodacus) ektoalangiiae* Drew & Hancock, sp. nov.

Thorax. Scutum orange-brown with an overall yellowish tint and a pair of small irregularly shaped black spots posterolaterally. Pleural areas orange-brown except for fuscous along anterior and posterior margins of mesopleural stripe and on central area of the katepisternum. Yellow markings as follows: postpronotal lobes; notopleura; a medium sized mesopleural stripe, reaching midway between anterior margin of notopleuron and anterior *npl.* seta dorsally, continuing onto katepisternum as a large spot, anterior margin straight; anatergite (posterior apex pale fuscous); anterior 2/3 katatergite (remainder orange-brown); two lateral postsutural vittae of medium width, narrowing only slightly posteriorly to end at the *ia.* seta. Postnotum red-brown. Scutellum yellow except for a narrow black basal band. Setae: *sc.* 2, *prsc.* 2, *ia.* 1, *p.sa.* 1, *a.sa.* 1, *mpl.* 1, *npl.* 2, *scp.* 4; all

setae strong and dark fuscous. Legs – all segments fulvous except fore tibiae pale fuscous and hind tibiae fuscous; mid tibiae each with an apical dark fuscous spur. Wings – length 5.2 mm; cells bc and c colourless; microtrichia in outer corner of cell c only; remainder of wings colourless except fuscous cell sc, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a broad fuscous cubital streak ending at wing margin. Dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen. Oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous to black except for a narrow orange-brown posterior margin; tergum II orange-brown except for large fulvous areas posterolaterally, a medial and two lateral transverse black spots anteriorly and narrow lateral black margins; terga III-V fulvous except for a broad medial and two broad lateral longitudinal black bands over all three terga and joined along anterior margin of tergum III. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short; sternum V with a slight concavity on posterior margin.

Female. As for male except as follows: without dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; abdominal tergum III without a pecten. Ovipositor: basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V, 0.6:1. Aculeus trilobed at apex. Length of antennal segment 3 (lost in male), 0.6 mm.

Attractant. No known record.

Distribution. Northeast Queensland; known only from the Goldsborough Valley near Gordonvale, Cairns district.

Host. *Alangium villosum* ssp. *polyosmoides* (Alangiaceae).

Comments. *B. ektoalangiae* fits into subgenus *Hemizeugodacus* Hardy in possessing a short posterior surstylus lobe, a slight concavity on the posterior margin of abdominal sternum V of male, a pecten on abdominal tergum III of male and prescutellar bristles present. It possesses two *sc.* bristles, not four as in the two previously known species of *Hemizeugodacus*. *B. ektoalangiae* is similar to *B. (H.) aglaiae* (Hardy) and *B. (H.) aurea* (May) in having a general red-brown body colouration with an overall yellowish tint, wings with a narrow costal band and cubital streak, postpronotal lobes and notopleura yellow and lateral postsutural yellow vittae present. It differs from *B. aglaiae* in lacking a medial postsutural yellow vitta on the scutum, and in possessing colourless cells bc and c, distinct black patterns on abdominal terga III-V and a trilobed apex on the aculeus of the female ovipositor. *B. ektoalangiae* has an interesting similarity with *B. aurea* in that they have been reared from different subspecies of the same rainforest plant, *Alangium villosum*, *B. aurea* from subspecies *tomentosum* in southeast Queensland and *B. ektoalangiae* from subspecies *polyosmoides* in northeast

Queensland. *B. ektoalangiae* differs from *B. aurea* in lacking a fuscous pattern on the wing in addition to the costal band and cubital streak and in possessing an entirely yellow scutellum, anterior supra-alar bristles, a mesopleural stripe of medium width, colourless cells bc and c with microtrichia in outer corner of cell c only, distinct black patterns on abdominal terga III-V and a trilobed apex on the aculeus of the female ovipositor.

Bactrocera (Javadacus) Hardy

Bactrocera (Javadacus) unirufa Drew

Comments. This species is widespread in rainforests from Rossville (south of Cooktown) to the Ingham district and responds to methyl eugenol. Specimens are also known from the Bamaga and Lockhart River areas of Cape York Peninsula and from Dunk Island. Previously recorded only from the type locality, Bellenden Ker Range (Drew 1989). The host is unknown.

Dacus (Callantra) Walker

Dacus (Callantra) pusillus (May)

Comments. This species is widespread in rainforests from Cooktown to the Ingham district. It also occurs at Lockhart River on Cape York Peninsula and was recorded from Torres Strait islands by Drew (1989). The host is unknown.

Dacus (Dacus) Fabricius

Dacus (Dacus) secamoneae Drew

Comments. A female from 3.5 km south of Chillagoe (17°10'S, 144°32'E), 26.iv.1997, C.J. Burwell (in QM) has yellow postpronotal lobes but otherwise appears to belong here. This species is known previously only from the Northern Territory (Drew 1989).

Acknowledgments

Fruit fly specimens used in this study were collected during field surveillance for the *Bactrocera papayae* eradication programme in North Queensland and in the North Australian Quarantine Survey in the Torres Strait Islands. The illustrations were prepared by M. Romig, Y. Martin and S. Phillips.

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AN ABERRANT FOOD-PLANT RECORD FOR *JALMENUS EVAGORAS* (DONOVAN) (LEPIDOPTERA: LYCAENIDAE)

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Abstract

Jalmenus evagoras (Donovan) larvae normally feed on *Acacia* spp. (Mimosaceae) but are here recorded feeding and completing development on the mistletoe *Amyema pendulum* (Sieb. ex Spreng.) Van Tiegh (Loranthaceae). It is likely that an oviposition mistake occurred due to the presence of attendant ants, the proximity of normal host plant and an expanding *J. evagoras* population.

Introduction

A small colony of *Jalmenus evagoras* (Donovan) at Griffith University, Nathan Campus, has been known and studied for several years (Smiley *et al.* 1988, Fraser 1997). The butterfly feeds exclusively on *Acacia* spp. (Mimosaceae) (e.g. Common and Waterhouse 1981, Braby 1988, Crosby 1994) and at Nathan the food-plant is *A. leiocalyx* (Domin) Pendley (Fraser 1997). The butterfly also has an obligate relationship with the ant *Iridomyrmex anceps* (Roger) (Pierce *et al.* 1987).

Since the colony was first recorded in 1988 it has been confined to the western end of the campus adjacent to the Ring Road (R. L. Kitching *pers. comm.*). However, during the summer of 1998 the colony underwent a population expansion and spread across much of the campus wherever its food-plant and attendant ants were present.

Observations

On 26 February 1998, one late instar and three smaller larvae of *J. evagoras* were discovered feeding on the mistletoe *Amyema pendulum* (Sieb. ex Spreng.) Van Tiegh. The mistletoe was growing on an overhanging branch of a small *Corymbia trachyphloia* (F. Muell.) (Myrtaceae) on a steep roadside bank approximately 60 cm from the ground. A small *Acacia leiocalyx*, approximately 1.5 m high, on which *J. evagoras* larvae were feeding, was growing within 60 cm of the base of the *C. trachyphloia*. Several other acacias within 3-4 m also had *J. evagoras* immatures. All were attended by *Iridomyrmex* ants and there did not appear to be any noticeable difference in ant attendance levels between those on the acacias or on the mistletoe. Adult *J. evagoras* were often observed flying around the mistletoe and nearby acacias and females were seen landing on the mistletoe and investigating the foliage.

The larvae on the mistletoe were periodically observed during a 16 day period. On 9 March one had entered the prepupal stage but on the following morning the prepupa had disappeared, possibly falling victim to jumper ants (*Myrmecia* sp.). Several of these ants were observed on the ground nearby and on the mistletoe and are known to be predators of *J. evagoras* larvae (Pierce 1984). On 14 March, two other larvae had disappeared but the

remaining one had pupated. This pupa was removed and a normal *J. evagoras* female emerged on 23 March (in author's collection). All the larvae feeding on the mistletoe appeared to develop at a normal rate.

Discussion

It is unlikely that all four larvae had strayed from the nearby *Acacia* to the mistletoe, since there was a thick leaf litter layer and terrestrial predators present. It is more likely that *J. evagoras* females made an oviposition mistake responding to the presence of *Iridomyrmex* on the mistletoe (see Atsatt 1981, Pierce and Elgar 1985). These mistakes often do not result in the successful development of the insect but, if successful, may be a precursor to speciation (Pierce 1984).

Females of *J. evagoras* usually oviposit on trees less than two meters tall (Smiley *et al.* 1988) and would not normally encounter mistletoe which is mostly confined to the upper branches of trees on campus (*circa* 15-20 m above ground). The unusual juxtaposition of plants, presence of suitable ants and the expanding nature of the butterfly colony probably contributed to the oviposition mistake. However, whatever the reasons, it is still significant that the larvae successfully completed development on the mistletoe.

Acknowledgment

I thank Mike Olsen (Griffith University) for identifying the plants.

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A CHECKLIST OF MACROLEPIDOPTERA COLLECTED FROM RAINFOREST AND FORMER FOREST AREAS ON BASALT SOILS ON THE ATHERTON TABLELAND

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Abstract

This paper lists 835 species of nocturnal Macrolepidoptera collected during a quantitative sampling programme undertaken in northern Queensland in 1996-97. About 94% of designated 'morphospecies' were determined to genus and 72% to species.

Introduction

In 1996/97 we made two collecting excursions to Atherton, northern Queensland, trapping for three weeks each in the dry and wet seasons. We ran 6 battery operated actinic light traps per night in 10 localities which included complex notophyll vine forest type 5b, growing on basalt soils, and sites where the same original forest had been cleared and was in early (scramblerland) to mid successional stages of regrowth (see Hopkins *et al.* 1996 for habitat definitions). Mature forest localities included the well known Curtain Fig, Picnic Crossing and Wongabel State Forest. For the purposes of this study 'Macromoths' were defined by the usual macrolepidopteran families excepting butterflies and, in addition, the Pyraloidea, Hyblaeoidea, Immoidea, Zygaenoidea, Sesiioidea and Castnioidea. The result was a total of 15,452 specimens which were sorted initially to morphospecies, counted and eventually identified as far as was possible by comparison with named specimens at ANIC, Canberra. Failure to identify specimens to species most commonly reflected the lack of an available name. The 835 species in our catch represents more than 17% of the named Australian fauna for groups considered. A selection of species is illustrated (Fig. 1). Faunistic relationships and ecological results are treated elsewhere (Kitching *et al.* 1997, Orr and Kitching, in press). The following is a list of the species we collected.

The Checklist

Species collected are listed following Neilsen *et al.* (1995) except where known species occurred which did not appear in that list. NAG refers to no available genus. The codes 'sp A', etc refer to determination labels on voucher specimens. The prefix 'aff' before a species name indicates a species close to the sample species but considered to be clearly different. Where uncertainty exists in a determination at the specific or generic level this is indicated by a question mark before the name.

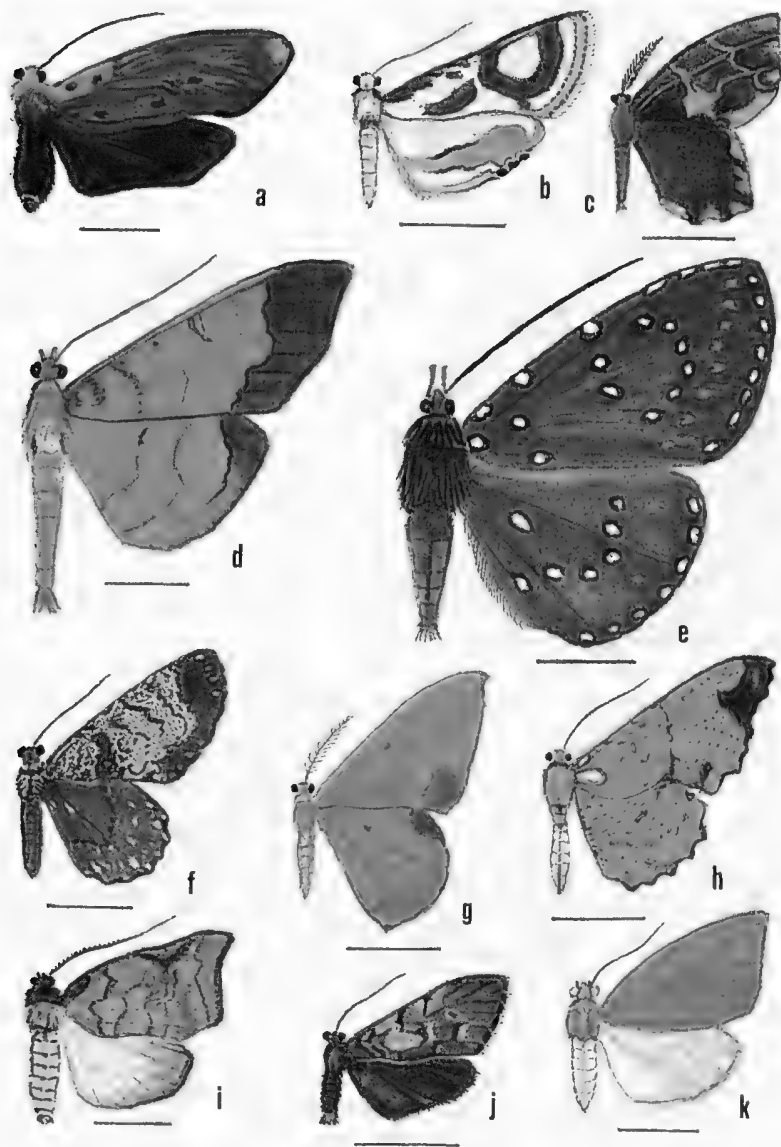


Fig. 1. (a) *Eustixis* sp.(in ANIC, unnamed), (b) *Theila siennata*, (c) *Peridilias* sp., (unusual form, close to *aprosita*), (d) *Meroctena staintonii*, (e) *Saroba niphomaculata*, (f) *Poecilasthena ischnophrica*, (g) *Comibaena mariae*, (h) *Corymica pryeri*, (i) *Scaphidriotis* sp. (in ANIC, unnamed), (j) *Beara falcata*, (k) *Erias* sp. Scale bars = 5 mm.

Table 1. List of moths recorded during 1996-97 near Atherton, Qld.

CHOREUTIDAE	<i>Doloessa viridis</i> Zeller
<i>Choreutis basalis</i> (Felder & Rogenhofer)	
<i>Choreutis metallica</i> (Turner)	Epipaschiinae
	<i>Pseudocera trissosticha</i> (Turner)
ZYGAENIDAE	<i>Salma hicanodes</i> (Turner)
<i>Zygaenidae</i> sp A	<i>Salma nephelodes</i> (Turner)
	<i>Lacalma albirufalis</i> (Hampson)
LACTURIDAE	<i>Lacalma</i> ? <i>mnimima</i> (Turner)
<i>Eustixis parallela</i> (Meyrick)	<i>Stericta philobrya</i> (Turner)
<i>Eustixis sapotearum</i> (Swainson)	<i>Stericta concisella</i> (Walker)
<i>Eustixis</i> sp	<i>Stericta</i> ? <i>rubroviridis</i> Warren
	<i>Stericta</i> ? <i>dochmoscia</i> (Turner)
LIMACODIDAE	<i>Stericta bryomima</i> (Turner)
<i>Mambara delocrossa</i> (Turner)	<i>Stericta</i> sp aff <i>bryomima</i> (Turner)
<i>Anaxidia lozogramma</i> (Turner)	<i>Stericta</i> sp
<i>Anaxidia</i> sp	<i>Orthaga seminivea</i> (Warren)
<i>Eloasa callidesma</i> (Lower)	
<i>Anepopsia eugyra</i> Turner	Endotrichinae
<i>Hypselolopha hypodrosa</i> Turner	<i>Endotricha ignealis</i> Geunée
<i>Praesusica placherodes</i> (Turner)	<i>Endotricha mesenterialis</i> (Walker)
<i>Thosea penthima</i> Turner	<i>Endotricha dispergens</i> T.P. Lucas
	<i>Endotricha pyrosalis</i> Geunée
IMMIDAE	<i>Endotricha lobibasalis</i> Hampson
<i>Imma lyrifera</i> Meyrick	<i>Endotricha pyrrhocoma</i> Turner
	<i>Larodryas haplocala</i> Turner
THYRIDIDAE	
Striglininae	Pyrulinae
<i>Striglina cinnamomea</i> (Rothschild)	<i>Ocrasa decoloralis</i> (Lederer)
<i>Banisia myrusalis</i> (Walker)	<i>Gauna flavibasalis</i> (Hampson)
	<i>Arescoptera idiotypa</i> Turner
Siculodinae	<i>Scenedra decoratalis</i> (Walker)
<i>Hypolamprus bastialis</i> (Walker)	<i>Tanyethira</i> sp
<i>Hypolamprus</i> sp aff <i>melilialis</i> (Swinhoe)	<i>Vitesa glaucoptera</i> Hampson
<i>Hypolamprus ypsilon</i> (Warren)	<i>Macna coelocrossa</i> (Turner)
<i>Addaea subtessellata</i> Walker	<i>Cardamyla didymalis</i> Walker
<i>Oxychophina theorina</i> (Meyrick)	
	Phycitinae
PYRALIDAE	Cryptoblabini
Galleriinae	<i>Cryptoblabes</i> spp A-E
<i>Tirathalba rufivena</i> (Walker)	<i>Berastagia</i> sp
<i>Tirathalba parasiticus</i> (T.P. Lucas)	<i>Pseudodavara</i> sp
<i>Heteromicta ochraceola</i> Hampson	NAG " <i>Cryptoblabes</i> " <i>ferrealis</i> (Lower)
<i>Heteromicta poedes</i> Turner	Cryptoblabini spp A-E
<i>Meyriccia latro</i> (Zeller)	<i>Guastica</i> sp

Phycitini

NAG "*Faveria*" *oculiferella* (Meyrick)NAG "*Faveria*" *poliochyta* (Turner)*Faveria laiasalis* Walker*Faveria tritalis* (Walker)? *Faveria* sp A*Ptyobathra* sp*Calguia* ? *defiguralis* Walker*Calguia* sp*Indomyrtae auchmodes* (Turner)*Tylocharis* sp aff *melanodes* (Hampson)*Etiella walsinghamella* Ragonot*Etiella behrii* (Zeller)*Protoetiella venustella* (Hampson)*Cathalia pallicostalis* (Walker)*Acrobasis olivalis* (Hampson)*Hypargyria metalliferella* Ragonot*Aurana actiosella* Walker*Hypsipyla robusta* (Moore)*Assara* spp A-C*Homoiosoma vagella* Zeller

Phycitini spp A-J

Peorini

Heosphora sp*Emmalocera* sp

Peorini spp A-G

Crambinae

Euchromus sp aff *cornus* Schoulten*Neargyria argyraspis* (Meyrick)? *Chilo* sp*Calamotropha paludella* (Hübner)*Calamotropha delatalis* (Walker)

Crambinae spp A -D

Nymphulinae

Araeomorpha diplopa (Lower)*Araeomorpha limnophila* Turner*Araeomorpha* sp? *Araeomorpha* sp*Hygraula nitens* (Butler)*Paraponyx dentizonalis* (Hampson)*Paraponyx villidalis* (Walker)*Paraponyx polydectalis* (Walker)*Paraponyx* ? *crisonalis* (Walker)*Paraponyx sternalis* (Zeller)*Paraponyx diminutalis* Snellen*Paraponyx dicentra* Meyrick*Paraponyx tenebralis* (Lower)*Elophila diffusalis* Snellen*Paracataclysta fuscalis* (Hampson)*Cataclysta lampetialis* Walker*Margarosticha sphenotis* Meyrick*Margarosticha repetitalis* (Warren)*Margarosticha* sp A*Strepsinoma cruesalis* (Walker)*Strepsinoma* ? *amaura* Meyrick*Strepsinoma* sp A*Strepsinoma* sp B*Tetremia teminitis* Meyrick*Theila siennata* (Warren)*Ambia ptolycusalis* Walker

Scopariinae

Scopariini

Scoparia aphrodes Meyrick

Scopariini sp A

Hoploscopini

Perimecta sp

Hoploscopini sp A

Schoenobiinae

? *Niphandoses pelleuces* Common

Cybalomiinae

Trichophyesis neophylla Meyrick

Cybalomiinae sp A

Evergestinae

Crocidolomia pavonana (Fabricius)*Crocidolomia suffusalis* (Hampson)

Odontiinae

Hemiscopis violacea (T.P. Lucas)*Hydrorybina polusalis* (Walker)*Pseudonoorda hemileuca* (Turner)*Trigonoorda trygoda* (Meyrick)

Glaphyriinae

Hellula undalis (Fabricius)

Pyraustinae

Pyraustini

Pyrausta panopealis (Walker)

Ebulea perflavis (Hampson)

Pagyda botydalis (Snellen)

Hyalobathra brevalis (Walker)

Hyalobathra minialis (Warren)

Paliga mandronalis (Walker)

Paliga ignealis (Walker)

Circobotys occulitilinea (Walker)

Lamprophaia albifimbrialis Walker

Lamprophaia ablactis Walker

Achyra massalis (Walker)

Urisiphita ornithopteris (Geunée)

Euclasta maceratalis Lederer

Spilomelini

Sameodes ioealis (Walker)

Sameodes cancellalis (Zeller)

Samea multiplicalis (Geunée)

Desmia discrepens (Butler)

Hymenia perspectalis (Hübner)

Spoladea recurvalis (Fabricius)

Symmoracma minoralis (Snellen)

Bradina manussalis (Walker)

Bradina admixtalis (Walker)

Aetholix flavibasis (Geunée)

Atelocentra chloraspis Meyrick

Pileocera meekii (T.P. Lucas)

Nacoleia amphicedalis (Walker)

Nacoleia mesochlora (Meyrick)

Nacoleia rhoealis (Walker)

Nacoleia glagoptera Turner

Nacoleia onychophragma Turner

Nacoleia syngenica Turner

Nacoleia obliquialis Hampson

Glycythyma leonina (Butler)

Metasia spilocrossa Turner

Metasia sp aff *capnochroa* Meyrick

Metasia ? *ateloantha* (Meyrick)

Metasia tiasalis (Walker)

Metasia sp A aff *familiaris* (Meyrick)

Metasia spp B-F

Metasia zinkenialis Hampson

Didymostoma aurotinctalis (Hampson)

Dysallacta negatalis (Walker)

Dysallacta sp

Glyphodes callipona Turner

Glyphodes caesalis

Glyphodes sp aff *onychinalis* (Geunée)

Glyphodes multilinealis Kenrick

Glyphodes stolalis Geunée

Glyphodes canthusalis Walker

Glyphodes conjunctalis Walker

Glyphodes bicolor (Swainson)

Glyphodes sp aff *microta* Meyrick

Glyphodes flavizonalis Hampson

Agrioglypta itysalis (Walker)

Agrioglypta excelsalis (Walker)

Talanga sexpunctalis (Moore)

Chabula acamasalis (Walker)

Cydalima laticostalis (Geunée)

Omiodes surrectalis (Walker)

Omiodes origoalis (Walker)

Omiodes basalticolic (Lederer)

Omiodes poeonalis (Walker)

Omoides diemenalis (Geunée)

Omiodes sp A

Omiodes chrysampyx (Turner)

Parotis marginata (Hampson)

? *Stemorrhages* sp A

Palpita sp A aff *unionalis* (Hübner)

Palpita sp B

Palpita limbata (Butler)

Palpita kiminensis Kirti & Rose

Cirrhocrista sp aff *annulifera* Hampson

Caprinia felderi Lederer

Trigonobela perfenestrata (Butler)

Leucinodes orbonalis Geunée

Sceliodes cordalis (Doubleday)

Terastia subjectalis Lederer

Agathodes ostentalis Geyer

Maruca vitrata (Fabricius)

Pygospila tyres (Cramer)

Syllepte ochrotozona Hampson

Syllepte ridopalis Swinhoe

Hariotolodes derogata (Fabricius)

Pardomima pompusalis (Walker)
Botyodes asialis Geunée
Meroctena staintonii Lederer
Notarcha aurolinealis (Walker)
Conogethes punctiferalis (Geunée)
Conogethes haemactalis Snellen
Lipararchis tranquillalis (Lederer)
Rhimphalea lindusalis (Walker)
Pycnarmon meritalis Walker
Prophantis sp
Cotachena histricalis (Walker)
Cotchena aliensis (Butler)
Spilomelini sp A
Aethaloessa calidalis (Geunée)
Aethaloessa sp
Orphanostigma abruptalis (Walker)
Orphanostigma angustale Hampson
Ectadiosoma straminea (T.P. Lucas)
Archernis callixantha Meyrick
Protonoceras mitis (Turner)
Prorodes mimica Swinhoe
Herpetogramma licarsisalis (Walker)
Herpetogramma stultatis (Walker)
Herpetogramma sp
Cnapholocrocis medinalis (Geunée)
Cnapholocrocis poeyalis (Boisduval)
Cnapholocrocis sp ? aff *bilinealis* (Hampson)
Cnapholocrocis sp

tribe uncertain

Pyraustinae spp A, B

GEOMETRIDAE

Ennominae

Hypochrosini

Corymica pryeri (Butler)

Scardamiini

Scardamia ithyzona Turner

Aplochlora sp

Baptini

Eurychoria geraspora (Turner)

Eurychoria sp ?aff *fictilis* (Turner)

Borbacha euchrysa (Lower)

Lithinini

Urostola magica Meyrick

Caberini

Parametrodes dispar Warren

Casbia sp aff *rectaria* Walker

Casbia albinotata Warren

Casbia sp aff *scardemiata* Warren

Lomographa sp A

Laophila sabulicolor (Turner)

Eutoeini

Luxiaria ochrophara (Turner)

Macariini

Godonela tessellata (Warren)

Boarmiini

NAG '*Boarmia*' *thermaea* (Meyrick)

NAG '*Boarmia*' *agoraea* (Meyrick)

? *Psilalcis isombra* (Meyrick)

Neogyne elongata Warren

Paradromulia ambigua Warren

Paradromulia sp A aff *ambigua* Warren

Paradromulia leucodesma (Turner)

Boarmiini spp A, B aff *Paradromulia*

Pleurolopha ? *nebridota* Turner

Ateloptila confusa Warren

Catoria camelaria (Geunée)

Catoria delectaria (Walker)

Ectropis bhurmitra Walker

Ectropis gravis (Turner)

Ectropis mniara Turner

Ectropis sp

Ectropis ? *lignea* Goldfinch

Cleora repetita (Butler)

Cleora illustraria (Walker)

Cleora sp aff *injectaria* (Walker)

Cleora tenebrata (D.S. Fletcher)

Cleora costiplaga (D.S. Fletcher)

Cleora sp A aff *perfumosa* (Warren)

Cleora sp B

Amblychia subrubida Warren

Chorodna strixaria (Geunée)

Racotis maculata (T.P. Lucas)

Polyacme dissimilis (Warren)
Polyacme subpulchra (Warren)
Polyacme sp
Hyposidra incomptaria (Walker)
Craspedosis leucosticta Warren
Bracca rotundata (Butler)

unplaced

Xenomusa metallica T.P. Lucas
Peridelias aprosita Turner

Oenochrominae

Oenochroma vinaria Geunée
Parepisparis multicolora (T.P. Lucas)
Taxeotis perlinearia (Walker)
Taxeotis ? *mimela* L.B. Prout
Taxeotis alloceros Turner
Taxeotis epigaea Turner
? *Taxeotis* sp
Epidesmia tryxaria (Geunée)
Epidesmia reservata (Walker)
Epidesmia sp A aff *phoenicina* Turner
Eumelea rosalia (Stoll)
Eumelea stipata Turner

Geometrinae

Hypodoxa sp aff *bryophylla* (Goldfinch)
Pingasa chlora (Stoll)
Aeolochroma hypochromaria (Geunée)
Aeolochroma saturataria (Walker)
Aeolochroma turneri (T.P. Lucas)
Oenochlora imperialalis Warren
Agathia ochrotypa Turner
Agathia prasinaspis Meyrick
Anisozyga insperata (Walker)
Anisozyga sp aff *speciosa* (T.P. Lucas)
Anisozyga fascians (T.P. Lucas)
Anisozyga goniota (Lower)
Anisozyga sp A
Metallochloa militaris (T.P. Lucas)
Metallochloa venusta (Warren)
Hemithea pellucidea (Turner)
Gelasma ? *calaina* (Turner)
Gelasma orthodesma (Lower)
Prasinocyma iosticta (Meyrick)

Prasinocyma caniola (Warren)
Comibaena inductaria (Geunée)
Comibaena mariae (T.P. Lucas)
Eucrostes disparata Walker
Mixocera latilineata (Walker)
Mixocera sp.
Pyrrhorachis pyrrhogona (Walker)

Sterrhinae

Organopoda olivescens Warren
Chrysocraspeda cruoraria (Warren)
?Traminda mundissima Walker
Gnamptoloma aventiaria (Geunée)
Anisodes punctata (Warren)
Anisodes sp aff *obstataria* (Walker)
Anisodes ? *niveopunctata* (Warren)
Anisodes sp aff *flavispila* (Warren)
Anisodes ? *flavirubra* (Warren)
Scopula sp aff *oppilata* (Walker)
Scopula ? *optivata* (Walker)
Scopula sp aff *optivata* (Walker)
Scopula spp A-C
Idaea sp aff *delosticta* (Turner)
Idaea inversata (Geunée)
Idaea sp ? aff *dolichopis* (Turner)
Idaea elaphrodes (Turner)
Idaea pilosata (Warren)
Idaea dasygus (Turner)
Idaea sp A
?Idaea sp B
Sterrhinae spp A, B

Larentiinae

Xanthorhoini
Chrysolarentia ? *plesia* (Turner)
?Xanthorhoe sp A, B
Epyaxa sodaliata (Walker)
Epyaxa ? *subidaria* (Geunée)
Visiana brujata (Geunée)

Trichopterygini

Sauris plumipes Dugdale
Sauris sp aff *malaca* (Meyrick)
Trichopterygini sp A

Eupitheciini

Gymnoscelis sp A*Larentiinae* sp C near *Gymnoscelis**Symmimetis muscosa* Turner*Symmimetis sylvatica* Turner*Chloroclystis elaeopa* Turner*Chloroclystis pyrrholopha* Turner*Phrissogonus* sp ?aff *laticostata* Walker*Chloroclystis cissocosma* Turner*Chloroclystis gonias* Turner*Chloroclystis* ? *delosticta* Turner*Chloroclystis* sp aff *plinthocyta* Turner*Chloroclystis* spp A-C*Chloroclystis* sp aff *pauillula* Turner*Tephroclystia tornolopha* Turner

Eupithecini spp A, B

Asthenini

Cretheis cymatodes (Meyrick)*Cretheis atrostrigata* Warren*Poecilasthena thalassius* (Meyrick)*Poecilasthena sthenommata* Turner*Poecilasthena ischnophrica* Turner

unplaced

Scotocyma albinotata (Walker)*Eccymatoge aorista* (Turner)*Heterochasta lasioplaca* Lower

DREPANIDAE

Astatochroa fuscimargo (Warren)

URANIIDAE

Uraniinae

Stesichora quadripunctata Warren*Micronia* sp A

Epipleminae

Chundana lugubris Walker*Lobogethes interrupta* Warren*Balantiucha mutans* (Butler)*Balantiucha* sp aff *leucocera* (Hampson)*Cathetus euthystichta* (Turner)

LASIOCAMPIDAE

Pararguda crocata (Turner)

ANTHELIDAE

Anthela ? *nicothoe* (Boisduval)*Anthela astata* Turner*Anthela* sp A ? aff *acuta* (Walker)*Anthela* sp B aff *acuta* (Walker)*Anthela* spp C-D*Anthela ocellata* (Walker)

Anthelidae sp A

EUPTEROTIDAE

Eupterote expansa (T.P. Lucas)

SATURNIDAE

Syntherata janetta (White)*Coscinoscera hercules* (Miskin)

SPHINGIDAE

Sphinginae

Agrius convolvuli (Linnaeus)

Macroglossinae

Macroglossum alcedo (Boisduval)*Hippotion rosetta* (Swinhoe)

NOTODONTIDAE

Ortholomia mollucana C. Felder*Syntypistis chloroplasta* Turner*Neostauropus viridissimus* (Bethune-Baker)*Cascera bella* Bethune-Baker*Omichlis hadromeres* Turner

LYMANTRIIDAE

Arctornis sp*Olene mendosa* Hübner*Orgyia* ? *australis* Walker*Calliteara farenoides* (T.P. Lucas)*Dura* sp*Dasychiroides* sp A*Euzora collucens* (T.P. Lucas)*Leptocneria reducta* (Walker)*Euproctis* sp aff *aliena* (Butler)*Euproctis xuthoptera* (Turner)*Euproctis trispila* (Turner)

Euproctis lutea (Fabricius)
Euproctis lucifuga (T.P. Lucas)
Euproctis epaxia Turner
Euproctis actor Turner
Euproctis leonina (Turner)
Euproctis spp A, B
Acyphas pelodes (Lower)
Acyphas sp

ARCTIIDAE

Lithosiinae

Heterallactis stenochrysa Turner
Chrysomesia lophoptera (Turner)
Schistophleps albida (Walker)
Schistophleps obducta (T.P. Lucas)
Psilopepla mollis (T.P. Lucas)
Notata modicus (T.P. Lucas)
Philenora sp ? aff *chionastis* (Meyrick)
Philenora aspectalella (Walker)
Philenora sp.
Lyclene pyraula (Meyrick)
Symmetrodes sciocosma Meyrick
Asura polypspila Turner
Asura monospila Turner
Asura coccinocosma Turner
Thallarcha staurocola (Meyrick)
Thallarcha sp A aff *epicela* Meyrick
Thallarcha epileuca Turner
 ? *Thallarcha* spp B-D
Damias pelochroa (Hampson)
Macaduma picroptila (Hampson)
Macaduma toxophora (Turner)
Macaduma sp aff *toxophora* (Turner)
Macaduma sp ? aff *strongyla* Turner
Halone interspersa (T.P. Lucas)
Halone sejuncta (R. Felder & Rogenhofer)
Halone ebaea Hampson
 ? *Halone* spp A, B
Scaptosyle dichotoma (Meyrick)
Heliosia micra Hampson
Microstola ammoscia Lower
Ameleta aff *panochra* Turner
Cyana meyricki (Rothschild)
Cyana obscura (Hampson)
 ? *Scaphidriotis* spp A, B

Scaphidriotis sp C aff *xylogramma* Turner
Atelophleps tridesma Turner
 ? *Atelophleps* sp
Goniosema euraphota Turner
Goniosema sp.
Calamidia hirta (Walker)
Manulea replana (Lewin)
Manulea sp aff *replana* (Lewin)
Manulea dorsalis (Walker)
Eilema plana (Boisduval)
Eilema sp aff *plana* (Boisduval)
Teulisna bipunctata (Walker)
Aedoea decreta (Butler)
Oenistis altica (Linnaeus)
Ateucheta zatesima (Hampson)
Scoliacma nana (Walker)
Scoliacma fasciata (Aurivillius)
Lambula transcripta (T.P. Lucas)
Lambula pleuroptycha Turner
Lambula obliquilinea Hampson
Lambula ? *phyllodes* (Meyrick)
Chrysoscota tanyphara Turner
 Lithosiinae spp A - C

Arctiinae

Argina astrea (Drury)
Utethesia pulchelloides Hampson
Utethesia aegrotum (Swinhoe)
Nyctimera luctuosa (Vollenhoven)
Nyctimera baulus (Boisduval)
Amerila rubripes Walker
Spilosoma curvata (Donovan)
Paralacydes maculifascia (Walker)
Creatonotus gangis (Linnaeus)

Ctenuchinae

Ceryx sphenodes (Meyrick)
Amata leucacma (Meyrick)
Amata ochropila (Turner)
Eressa megalospila Turner

AGANIDAE

Digama marmorea Butler
Agape chloropyga (Walker)
Asota heliconia (Linnaeus)

HERMINIIDAE

Pogonia micrastis (Meyrick)
Pogonia umbrifera (T.P. Lucas)
Nodaria cornicalis (Fabricius)
Polypogon fractalis (Geunée)
Squamipalpus pantoa (Turner)
Hydrillodes fenustellis (Walker)
Hydrillodes spp A - E
Simplicia caeneusalis (Walker)
Adraspa ablualis Walker
Bocana manifestalis Walker
Corethrobela melanophaes Turner
Auchmophanes platysara (Turner)
Stenhypena albopunctata (Bethune-Baker)
 Herminiidae sp A

NOCTUIDAE

Rivulinae

Rivula ? *curvifera* (Walker)
Rivula everta Swinhoe
Rivula concinna (T.P. Lucas)
Rivula sp aff *concinna* (T.P. Lucas)
Rivula biagi Bethune-Baker
 ? *Rivula* sp

Hypenodinae

Trigonistis sp ? aff *demonias* Meyrick
Luceria sp aff *oculalis* (Moore)
Luceria sp A
 Hypenodinae spp A - E

Hypeninae

Lysimelia lenis (T.P. Lucas)
Briha biguttata Walker
Rhynchodontodes chalcias (T. P. Lucas)
Hypena orthographa Turner
Hypena subvitalis Walker
Hypena simplex T.P. Lucas
Hypena sp aff *simplex* T.P. Lucas
Hypena conscitilis Walker
Hypena gonospilalis Walker
Hypena ? *masuralis* Geunée
Hypena laceratalis Walker
Hypena sp aff *fijiensis* Robinson
Hypena spp A, B

Dichromia quinquialis Walker
Foveades sp
Mecistoptera sp
 NAG "Hypena" *rhyncophora* (Lower)
 NAG "Hypenodes" *porphyritica* (Meyrick)
Synolulis rhodinastis (Meyrick)
Philogethes metableta Turner
Hypertrocta brunnea (Bethune-Baker)
Prolophota pallida (Turner)
Esthadora versicolor Turner
Esthadora variabilis (Swinhoe)
Parilyrgis concolor Bethune-Baker
Naarda sp.
Artigisa impropria (Walker)
Sandava xylistis Swinhoe
Elaphristis anthracitis (Turner)
Elaphristis psoloessa (Turner)
Elaphristis melanica (Turner)
Prionopterina grammatis (Meyrick)
Lophotoma diagrapha Turner
Calathusa hypotherma (Lower)
Calathusa basicunea Walker
 Hypeninae sp A

Catocalinae

Tamba sp aff *haemacta* (Turner)
Amphiongia chordophoides Lucas
Hypocala deflorata (Fabricius)
Axioteta oenoplex Turner
Axioteta turneri Bethune-Baker
Anomis planalis (Swinhoe)
Anomis flava Fabricius
Anomis involuta Walker
Anomis definata Lucas
Anomis combinans Walker
Anomis xanthochroa Butler
Oxyodes tricolor Geunée
Hypospila creberrima (Walker)
Dahlia capnobela (Turner)
Saroba niphomaculata (Lower)
Loxioda hampsoni (Bethune-Baker)
Gesonina obeditalis Walker
Raparna crocophara Turner
Rhesala imparata Walker
Rhesalides curvata (Lucas)

Acantholipes trajectory Walker
Acantholipes juba Swinhoe
Meranda susialis Walker
Alapadna pauropis Turner
Parapadna placospila Turner
Tolpoides melanoproctis Hampson
Tolpiodes spp A -B
Tolpia conscutulana Walker
Tolpia spp A- E
Pseudogyrtonea fulvana Bethune-Baker
Pseudogyrtonea perversa Walker
Chodda ochraeovenata Bethune-Baker
Bocula odontosema Turner
Fodina sp aff *ostorius* (Donovan)
Polydesmiola meeki (Lucas)
Ophyx eurrhoa Lower
Pantidia sparsa Geunée
Pantidia metaspile Walker
Pantidia sp aff *metaspila* Walker
Pantidia spp A- C
Tathorhynchus fallax Swinhoe
Alophosoma hypoxantha (Lower)
Sympis rufibasis Geunée
Sympis sp aff *rufibasis* Geunée
Platyja exequialis (Lucas)
Ericeia pertendens (Walker)
Nagia linteola (Geunée)
Diatenes aglossoides Geunée
Mocis alterna (Walker)
Mocis frugalis Fabricius
Mocis trifasciata Stephens
Avatha discolor (Fabricius)
Avatha subumbra Bethune-Baker
Chalciope alcyona Druce
Trigonodes hyppasia Cramer
Grammodes ocellata Tepper
Grammodes cooma Swinhoe
Dysgonia monogona (Lower)
Dysgonia senex (Walker)
Dysgonia constricta (Butler)
Achaea janata Linnaeus
Ercheia dubia (Butler)
Ophiusa discrimans (Walker)
Ophiusa disjuncta Walker
Donuca rubropicta (Butler)

Catocalinae spp A, B in ANIC

Plusiinae

Argyrogramma signata Fabricius
Chrysodeixis eriosoma (Doubleday)
Ctenoplusia albostrata Bremer & Grey
Ctenoplusia placida Moore
Thysanoplusia orichalcea Fabricius

Stictopterinae

Lophoptera hemithyris Hampson
Lophoptera vittigera Walker

Euteliinae

Pataeta carbo (Geunée)
Targalla delatrix (Geunée)
Anigraea ochrobasis Hampson

Chloephorinae

Xanthodes emboloscia (Turner)
Erias smaragdina Butler
Erias sp aff *smaragdina*
Aiteta iridias (Meyrick)
Maurilia iconica (Walker)
Beara falcata Holloway
Maceda mansuetta Walker
Maceda rotundimaculata Warren
Westermania gloriosa (Hampson)

Sarothripinae

Blenina viridata Bethune-Baker
Giaura punctata (Lucas)
Nycteola symmicta (Turner)
Nycteola indica R. Felder
Nycteola exophila (Turner)
Nanaguna breviuscula Walker

Nolinae

Acatapaustus atrinota Hampson
Nola achromia Hampson
Nola platygonia Lower
Nola sp D aff *ceratonia* Turner
Nola sp B aff *crucigera* Turner
Nola sp A aff *fasciata* Walker
Nola ? *pyncopasta* (Turner)

Nola sp G aff *eucompsa* Turner
Nola sp E aff *pyncographa* (Turner)
Nola elaphra Turner
Nola pygmaeodes Turner
Nola diastrophia Turner
Nola sp aff *diastrophia* (Turner)
Nola aff *argentea* (T.P. Lucas)
Nola sp C aff *sphaerospila* Turner
Nola taeniata Snellen
Nola sp aff *fovifera* (Hampson)
Nola sp H
Nolinae spp A-C
Pisara hyalospila Hampson

Acontiinae

Acontia thapsina (Turner)
Acontia elaeoa (Hampson)
Acontia nivipicta Butler
Acontia crocata Geunée
Maliattha amorpha (Butler)
Maliattha signifera Walker
Maliattha ritsemae (Snellen)
? *Eustrotia* sp
Eulocastra fasciata Butler
NAG 'Oruza' *stragulata* (Pagenstecher)
NAG 'Oruza' *cariosa* (Lucas)
Hyposada hydrocampata (Geunée)
Corgatha sp aff *figuralis* (Walker)
Enispa niviceps Turner
Sophia concavata Walker
Sophia poecilota Turner
Sophia sp aff *poecilota*
Carmara subcervina Walker
Hypobleta cymaea Turner
NAG *lithochroma* Turner near *Ozarba*
Metachrostis paurograpta Butler
NAG "Eublemma" *glaucochroa* Turner
Trissemis prasinoscia Meyrick
Trissemis ochrochlora (Turner)
Alypophanes iridocosma Turner
Microedma extorris Warren
Eublemma vestalis (Butler)
Eublemma ragusana (Freyer)
Eublemma sp aff *ragusana*
Eublemma lozostrophia Turner

Eublemma rivula Moore
Eublemma cochylionides (Geunée)
Eublemma anachoresis (Walengren)
Autaba silicula Swinhoe
Autaba abrupta (Walker)
Amyna natalis Walker
Amyna punctum (Fabricius)
Amyna axis (Geunée)
Amyna sp
? *Amyna* sp
Acontiinae sp A

Agaristinae

Coenotoca subaspersa (Walker)
Mimeusemia centralis (Rothschild)

Amphipyryinae

Sasunaga leucorina (Hampson)
Callopostria placodoides (Geunée)
Platyprosopa nigrostrigata (Bethune-Baker)
Condica illecta Walker
Condica aroana Bethune-Baker
Condica dolorosa Walker
Spodoptera litura Fabricius
Spodoptera mauritia Boisduval
Craniophora fasciata (Moore)
Chasmina tibialis (Fabricius)
Callyna leuconota Lower
Callyna monoleuca Walker
Aedia leucomelas Linnaeus
Acrapex spp A, B
Bathytrichia truncata (Walker)
Athetis thoracica Moore
Athetis tenuis Butler
Athetis striolata (Butler)
Athetis reclusa Walker
Athetis maculatra Lower
Proteuxoa flexirena Walker
Proteuxoa hypochalcis Turner
Proteuxoa sp

Cuculliinae

Neogalea sunia (Geunée)

Hadeninae	<i>Leucania</i> sp.
NAG " <i>Dasygaster</i> " <i>exarans</i> Lucas	<i>Tiracola plagiata</i> Walker
NAG " <i>Eurypsyche</i> " <i>scottii</i> (Butler)	<i>Elusa semipecten</i> Swinhoe
<i>Mythimna reversa</i> Moore	<i>Elusa</i> ? <i>oenolopha</i> Walker
<i>Mythimna formosana</i> Butler	<i>Elusa</i> sp B
<i>Mythimna</i> sp aff <i>formosana</i> Butler	
<i>Leucania loreyi</i> Duponchel	Noctuinae
<i>Leucania stenographa</i> Lower	<i>Agrotis ipsilon</i> Hufnagel
<i>Leucania polysticha</i> Turner	<i>Agrotis munda</i> Walker
<i>Leucania linearis</i> Lucas	
<i>Leucania abdominalis</i> (Walker)	Heliothinae
<i>Leucania diatrecta</i> Butler	<i>Adisura dulcis</i> Moore
<i>Leucania leucocosta</i> Lower	<i>Australothis rubescens</i> (Walker)
<i>Leucania rhodopsara</i> Turner	<i>Helicoverpa armigera</i> Hübner
<i>Leucania porphyrodes</i> Turner	<i>Helicoverpa assulta</i> (Geunée)

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AN OVERLOOKED GENERIC NAME IN THE DYNASTINAE (COLEOPTERA: SCARABAEIDAE)

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Abstract

Neatocnemis Prell, 1936 is placed as a new synonym of *Neocnecus* Sharp, 1878, both described as replacement names for *Neocnemis* Sharp, 1875. The two Australian taxa are thus *Neocnecus punctata* (Sharp, 1875), stat. rev. and *Neocnecus minor* (Carne, 1961), comb. nov.

Discussion

Sharp (1875) proposed a new genus and species name *Neocnemis punctata* Sharp for a monotypic Australian scarabaeid beetle. Three years later, in a six-line statement, Sharp (1878) proposed the name *Neocnecus* Sharp as a replacement for *Neocnemis* Sharp, the latter being a junior homonym of *Neocnemis* Crotch, 1867.

Sharp's action of 1878 seems to have passed unnoticed as Prell (1936) proposed *Neatocnemis* Prell as a replacement name for *Neocnemis* Sharp. Interestingly though, in Derksen and Scheiding-Göllner (1968, p. 115), Sharp's 1875 reference is followed immediately by his 1878 reference, although no details of the contents of either publication are given. *Neocnecus* Sharp was not recorded in Neave (1940) or in subsequent volumes. In the Zoological Catalogue of Australia dealing with the Scarabaeidae, Cassis and Weir (1992) make no reference to Sharp's replacement name.

Neatocnemis thus becomes a new junior synonym of *Neocnecus* and *N. punctata* reverts to the combination *Neocnecus punctata* (Sharp), stat. rev., whilst a second Australian species, *Neatocnemis minor* Carne is newly transferred to *Neocnecus*, as *Neocnecus minor* (Carne), comb. nov.

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ASPARAGUS: A NEW HOST RECORD FOR *HELICOVERPA ARMIGERA* (HÜBNER) (LEPIDOPTERA: NOCTUIDAE)

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Abstract

Asparagus officinalis (Liliaceae) is recorded as a potential host of *Helicoverpa armigera* (Hübner) and an earlier record of this plant as a host of *H. punctigera* (Wallengren) is questioned.

Introduction

Helicoverpa spp. are generally acknowledged as major pests of a wide range of crops in Australia. Zalucki *et al.* (1986) collated the published host records for both *H. armigera* (Hübner) and *H. punctigera* (Wallengren) and reported 75 and 127 species of plants as hosts of the two species respectively. Zalucki *et al.* (1994) added a further 26 species to the list for *H. armigera*.

Here, we add asparagus (*Asparagus officinalis* [Liliaceae]) to the host list for *H. armigera* and question the validity of the record in Zalucki *et al.* (1986) of *A. officinalis* as a host of *H. punctigera*.

Methods and Results

Trials on the agronomy of asparagus were carried out from 1988 to 1997 at Bundaberg Research Station (24°52'S, 152°21'E) to support a small commercial industry in southeast Queensland (J. K. Olsen, pers. comm.). Spears were harvested from August to October. In October 1996 *Helicoverpa* eggs were noticed among the bracts of freshly harvested spears. Eggs may have been laid on the asparagus in previous years but elicited no interest in those harvesting the crop. Eggs were present on 5-10% of spears and frequently several eggs were present on a single spear.

Spears with eggs were held until the eggs hatched. The developing larvae were given fresh spears on which to feed every 3-4 days until pupation. All rearing was done in a constant temperature cabinet at 25°C with a 12:12 light:dark cycle. Most of the resultant moths were dissected for identification and several were identified on wing characters (Common 1953).

All the moths were *H. armigera*. The developmental rates of the larvae reared on asparagus and of the subsequent pupae were the same as those of larvae and pupae collected as eggs on tomatoes at the same time and reared on a standard navy-bean based diet (Twine 1971), commonly used to rear *Helicoverpa* species, although detailed records of the developmental times were not kept. There was little mortality. The moths were of similar size and appearance to those reared on diet and they showed no obvious defects. The reproductive capability of the moths was not tested as most were dissected for identification.

Discussion

Asparagus officinalis can be added to the list of food plants for *H. armigera* and probably to its host list. Eggs were laid on the plant and larvae developed normally to produce apparently healthy adults. Kitching and Zalucki (1983) warn of the dangers of assuming that the presence of eggs on a plant is evidence that it is a food plant for the insect and suggest that a food plant should be one on which "the species can complete its immature feeding period and then successfully complete its pupal/adult metamorphosis." *Asparagus* satisfies this condition for *H. armigera*. Zalucki *et al.* (1986) state that for a plant to be considered a host, the insect must be able to complete development to the adult stage and be capable of producing fertile offspring. While the reproductive capability of *H. armigera* reared on asparagus was not determined, there was no indication, through factors such as reduced developmental rate, reduced size or the presence of deformities, that the moths would not have produced fertile offspring. At the very least, asparagus is a potential host of *H. armigera*.

It is unlikely that *H. armigera* would become an important pest of commercially grown asparagus. Spears emerge from the ground and are harvested in one or two days so eggs would not hatch before harvest. It is likely that many eggs would be dislodged from the spears during postharvest washing, while the development of any remaining eggs would be slowed, or the eggs killed, by subsequent hydrocooling of the spears, ideally to 2-3°C. However, it is possible that larvae could develop and be present on marketed produce. Unharvested spears develop into ferns in several weeks but it is not known if ferns will support larval development. Larvae may move to freshly emerged spears as fern growth proceeds and so complete development on a succession of spears.

Zalucki *et al.* (1986) included asparagus as a host of *H. punctigera*, based on the records in Lea (1928). However, these records should be treated with caution. Lea (1928) nominally wrote about *Heliothis obsoleta* (a junior synonym of *H. armigera*) but, as discussed by Common (1953), probably was referring to *H. punctigera*. Lea (1928) acknowledged that much of the information in his article was drawn from literature from the United States of America and, as stated by Common (1953), "it is difficult to decide therefore how much of his information applied to the local species." The host table in Lea (1928), which includes asparagus, does not specify if the records were local or from the literature and asparagus is not mentioned in discussions of observed damage to plants in the text. There is no evidence that Zalucki *et al.* (1986) verified Lea's host records before including them in their review. Hence there must be considerable doubt about the veracity of the record of asparagus as a host for *H. punctigera*.

Both *H. armigera* and *H. punctigera* were present in the Bundaberg district when the eggs were noticed on asparagus. Eggs collected then from nearby

tomatoes and reared to adults on diet produced 56% *H. armigera* and 44% *H. punctigera* (Kay, unpublished data). That only *H. armigera* was reared from eggs found on asparagus indicates that asparagus was not attractive or suitable for oviposition by *H. punctigera*.

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C O N T E N T S

DANIELS, G. An overlooked generic name in the Scarabaeidae (Coleoptera)	28
DREW, R.A.I., HANCOCK, D.L. and ROMIC, M.C. New species and records of fruit flies (Diptera: Tephritidae: Dacinae) from north Queensland.	1
EASTWOOD, R. An aberrant food-plant record for <i>Jalmenus evagoras</i> (Donovan) (Lepidoptera: Lycaenidae).	13
ORR, A.G. and KITCHING, R.L. A checklist of Macrolepidoptera collected from rainforest and former forest areas on basalt soils on the Atherton Tableland.	15
KAY, I.R. and HARDY, A.T. Asparagus: a new host record for <i>Helicoverpa armigera</i> (Hübner) (Lepidoptera: Noctuidae).	29
RECENT LITERATURE An accumulative bibliography of Australian entomology	32
ENTOMOLOGICAL NOTICES	Inside back cover.
